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Poetry.

LOVE OF FLOWERS.

Oh! Maggie loves the lily fair,
And Annie loves the rose:
But John and I and Willie too,
Love every flower that blows.

We love the golden buttercup,
We love the daisy white;
The violet blooming in the shade,
And the roses in the light:

And the lily that so like a queen
Lifts up its beauteous head;
And the dahlia and the tulip tall,
Of every hue and shade;

The wall-flower and the marigold,
And the pretty London-pride:
And the blue-bell hanging down its head,
Its laughing eye to hide;

And the purple heather climbing round
Our bonny Scottish hills,
And the little primrose springing up
Beside the mountain rills;

And the holly-hock that turns about
Its head to seek the sun;—
Oh! dearly do we love the flowers,
And we love them every one,

For better than our painted toys,
Though gliding bright and gay,
We love the gentle flowers that bloom
In the sunny summer day.

For it was God who made the flowers,
And careth for them all;
And for our Heavenly Father's love
There is not one too small.

He fans them with the gentle wind
He feeds them with the dew;
And the God who loves the little flowers
Loves little children too.

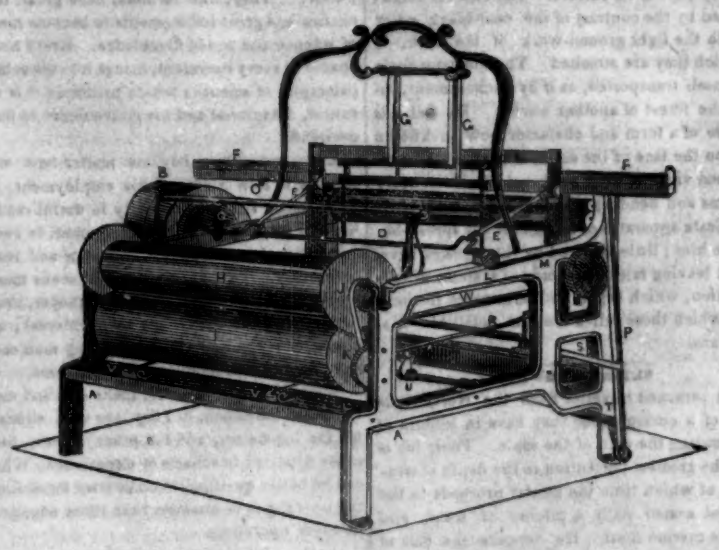
Sabbath Thoughts.

It is "fading, fast away"—
Smiling sadly, as it dies—
This calm and gentle Sabbath Day.
How have we lived its hours?
How have we culled its flowers?
How have we used our powers?
Father in Heaven! dare we ask—
Thou who hast seen beneath the mask?

We have knelt down to pray,
And breathed words bereft of soul,
And crushed love's kindling ray;
And dreamed of beauties fair and bright,
Which closed our souls to God's pure light
And bowed our wills 'neath sin's strong might.
The world in us should have no part,
And sins have filled each wandering heart.

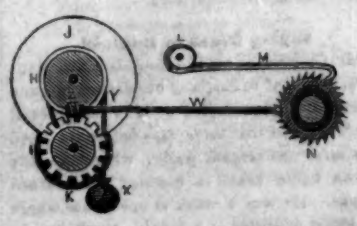
Ah, Father! if we love thee well,
The fleeting hours would be a knell
Warning our thoughts above.
And sadness, and wild longings vain,
And vanity, and pride, and pain,
Give place to holy love.

IMPROVED POWER LOOM.---Figure 1.



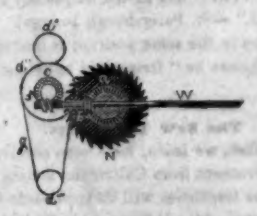
The accompanying engravings represent an improved Power Loom invented by Mr. William Stearns, of Dover, N. H., who has taken measures to secure a patent for the improvements, which relate to the let off and take up of the warp and cloth beams, and the mode of adjusting and retaining the warp beam in its place. The improvements, by experienced men, have been considered *valuable*.—Fig. 1, is a perspective view taken from the back part to represent the new points better.—Fig. 2, is a section showing the ratchet rod which moves in conjunction with the lathe, to work both the let off and take up beams, but representing only the warp beam. Fig. 2, is a section (seen from inside,) of the ratchet wheel that moves the take up rollers or beams. The same letters, refer to like parts on all the figures. A, is the frame of the loom.—B, are the fast and driving pulleys of the loom. Q, is a cog wheel on the pully shaft. It gears with a cog wheel below (not seen) to drive the shaft U, which has cams on it, to operate the treaddles (not seen) giving them a reciprocating motion, to work the heddles, G G. F F, are the shuttle boxes on the lathe. E E, are flexible arms attached to the lathe, and to small cranks on the pully or driving shaft D, to vibrate the lathe. This shaft D, also moves the cloth and warp beams. This is done by

Fig. 2.



having a ratchet rod M, attached on the outside end to an eccentric L, on the shaft D. This eccentric gives a reciprocating motion to the ratchet rod M, the ratchet of which meshes into the ratchet wheel N, the which ratchet wheel moves an axle W, inside of the frame, to operate in unison with the let off and take up. Fig. 2, shows the combination of the ratchet rod and ratchet wheel. The ratchet wheel N is fixed on the frame on a short shaft. On the inside of its shaft is a small bevel pinion *a* fig. 3, which meshes into a pinion *b*, on the axle W, and thus motion is given to the said axle. Thus it will be observed, that the main shaft D, in combination with the lathe, moves the ratchet rod M, and the ratchet rod moves the wheel N, and this wheel moves the axle W, the which axle has a worm screw *f*, at the front end and a worm *z*, on the back end; the former driving the pinion C, on the cloth beam axis *b* 2, and the latter the cog wheel K on the axis of the covered roller I, in figs. 1 and 2. Figures 2 and 3, show the machinery and gearing, which from the eccentric L, on the lathe shaft D, moves the warp and cloth beams, and the arrangement will be clearly understood if the reader turns in his mind, the shaft W, fig. 3, and joins it with the shaft fig. 2, reversing the rollers *d* 1, *d* 2, and *d* 3, and leaving out the duplicate wheel N. The journals of the warp beam revolve in vertical slots which allow it to lower as the warp is given off, and as it is moved on-

Fig. 3.



ly by I as it revolves, its motion must be uniform. The ratchet that moves the wheel N, moves the said wheel one notch for every stroke of the lathe, therefore the warp and cloth beams being first graduated in their required traverse, the lathe may be said to move the let off and take up, exactly one pick every stroke. When the number of picks in the inch is required to be changed, the ratchet wheel N must be changed to correspond.—Otherwise the cut off and take up continually coincide in the equal and exact motion required for each. X is a weight hung on the strap Y, fig. 3, to hold down the warp beam. J, is the rim on the beam, and *g*, fig. 3, is a band which moves the cloth beam or roller. The cloth passes over *d* 1, then extending nearly around *d* 2 and is wound up on *d* 3. P, is the picker staff, they have coiled springs T, at the bottom, inside, to throw them back—a good arrangement. O is a swinging roll, the offices of which is to allow the warp beam to be adjusted, for any cause, by simply swinging it forward. The warp passes over this roll. V V, are the treaddle joints. R, is the vibrating rod that moves the picker staff—by a strap S, passing around a small roll (not seen).

To those skilled in the art, the merits of this invention are apparent; although a power loom is one of the most difficult machines to describe, we believe that tolerable correct idea of one, will be acquired, by a close attention to the above description. More information respecting rights, &c. may be obtained by letter, post paid, to Mr. Stearns; and there is no doubt but his invention will soon find its way into general favor.

RAILROAD NEWS.

Fires on the Railroad.

The extreme dry weather has reduced a vast quantity of decaying vegetable matter, on the line of the Syracuse and Utica Railroad, to a combustible state, and fires have been frequent and injurious to a considerable extent between Syracuse and Rome. A good deal of fence and much wood have been burned. In one instance 500 cords of the latter, belonging to the company, were consumed. The company have been compelled to keep an unusual number of men on the road to watch and extinguish fires.

Hartford, Providence and Fishkill Railroad.

This great work is progressing rapidly.—We think it will be completed from Williamantic to the Naugatuck valley, a distance of 67 miles early in the coming year. The capitalists of Bristol have made a handsome subscription to the stock amounting in the aggregate to $38,000. This is as handsome as the Hartford subscription, considering the size of the place, and is not surpassed by railroad subscription in any town or city of this Union. It is the intention of the company to complete the road to Bristol the present year, if it is possible.

The Tunnel Falling.

A piece of rock weighing about five tons fell last week from the top of the Tunnel, of the Harlem Railroad at Yorkville, directly across the track, knocking the track to pieces. It must have fallen after one o'clock in the morning, as the up train of cars, passed through at 1 o'clock. The company had the rock removed, so that the cars could pass through.

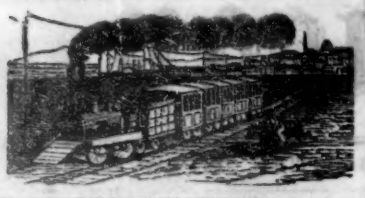
American Steam Boats in India.

In the London Athenæum, of July 14th, there is an article on the navigation by steam of the rivers of British India, which is worth the attention of our constructors and navigators. One of the works reviewed, is an account of certain improvements on the Ganges by Mr. Albert Robinson, who has been occupied as a practical engineer in our United States. "He determined that the Ganges should have vessels as good, as large and as fast as those of America; and he resolved to combine with these qualities the solidity, strength and safety of English manufacture." The narrative of his persevering and most arduous efforts possesses much interest. He continued them until six or seven of his perfect vessels were placed on the Ganges, on which they now ply with all speed and regularity. The reviewer affirms that all the expectations which the engineers held out, have been realized. But the Indus—"as broad as the Mississippi, deeper, even and navigable over two or three thousand miles—may yet become, with such steam navigation, all that the Mississippi is to America."

Reclaiming Clay Land.

An English agricultural writer says that the present tillage system as practised by scientific men in England is doubtless an immense improvement on the system in vogue twenty years ago—"but of all the discoveries of the present day, the conversion of stiff stubborn clays into a friable mould, through the means of thorough draining, double trenching, or subsoiling, is by far the greatest. And if we consider fully the great importance of it, the enormous benefit it has conferred on landed proprietors, the great change it has effected on the face of a country, and the complete revolution it has made in the whole farming practice, we cannot be too thankful to Mr. Smith, of Deanston, the author of it."

A Mormon settlement has been formed at the Beaver Island in Lake Michigan. They number 500, and are rapidly increasing.



Indian Corn in England.

An experiment has been made upon a small scale with some Indian Corn in England.—The seed was put into a small enclosure in St. James Park, London, on the 24th of May last, and though for some time retarded by easterly winds, the young shoots came up well. However, when the plants began to feel the cheering influences of light and air with a hotter sun, the success of the experiment was abundantly testified by the vigorous aspect of the little crop. The spot selected was not favorable to the experiment, being close to a nursery of young trees. It is estimated that thirty acres of corn would be worth £400, if the soil be of an average quality and properly drained. The cultivation of corn has been deemed of so much importance by the Council of the Royal Agricultural Society of England, that two very able papers have already been published in the Society's Journal explanatory of the properties of this plant, and pointing out the best system of culture. Should the experiment now in course of trial in St James's Park succeed to the extent predicted, it is presumed that it will be very generally adopted.

Perilous Balloon Ascent and Descent.

On the 25th ult. Mr. Green the veteran æronaut with his wife and several other individuals made an ascension with his great Nassau Balloon, from Vauxhall, London. After ascending some distance into the air, it came down again rapidly. Mr. Green, who was seated in the car, perceiving the extreme danger, commenced emptying the sand bags of ballast as quickly as he possibly could, but even this did not prevent the gradual sinking. On passing over the St. George's road, near West-square, the balloon landed on the roofs of the houses Nos. 94 and 95, on the north side of the London road. The car, in which seven of the æronauts were seated, struck the front of the house with considerable violence, so much so that three of the persons who were standing on the hoop were thrown forward on the roof, which fortunately happened to be a flat one, but the fourth clung to the net-work of the balloon. The machine being thus relieved from the weight of three of its occupants, and having escaped perforation, instantly rose into the air to a considerable altitude, when a fresh current of air carried it in a southerly direction, apparently towards Croyden. A messenger afterwards arrived at Vauxhall gardens, conveying the information that, after passing over a great portion of the county of Kent, the balloon was safely settled upon terra firma in an open field, within half a mile of Erith Church.

Steam Marine of France.

A recent official publication shows the steam marine of France to consist of sixty-one vessels, with an aggregate of 13,200 horse power. France has besides, completely armed 80 ships of the line, 8 frigates, 17 corvettes, 21 brigs, and 27 schooners, cutters, &c. She has also 10 large troop ships. Her entire naval armament is said to be in a high state of efficiency.

[If the United States would take it into their heads to give Louis Napoleon a thrashing for his bad behavior, some no doubt would be frightened at the above terrific array of steam ships; but such fears would be groundless, as we have learned from experience, that French steam ships cannot cross the Atlantic, without putting into Halifax for coal.

Susquehannah Trade.

The Elkton (Md.) Democrat says that the sawed lumber brought to Port Deposite annually is valued at $75,000,000; while the shingles and unsawed timber which are brought down the Susquehannah to the same place swell the aggregate to $200,000,000! The trade in granite from quarries in the immediate vicinity of Port Deposite is valued at over $75,000.

Vegetable Remains in Coal.

An abundance of distinctly preserved vegetable remains occur through the coal mines of Great Britain. But the first example is found in the coal mines of Bohemia. The most elaborate imitations of living foliage upon the painted ceilings of Italian palaces, bear no comparison with the beauteous profusion of extant vegetables forms, in which the galleries of these instructive coal mines are overhung. The roof is covered as with a canopy of gorgeous tapestry, with festoons of the most graceful foliage, hung in wild confusion over every part of its surface. The effect is heightened by the contrast of the coal-black color with the light ground-work of the rock, to which they are attached. The spectator feels himself transported, as if by enchantment, into the forest of another world. He beholds trees of a form and character now unknown upon the face of the earth, almost in the beauty and viger of their primeval life, their scaly stems and bending branches, and with their delicate apparatus of foliage are all spread before him; little impared by the lapse of ages, and leaving faithful records of systems of vegetation, which began and terminated in times of which those relics are the infallible historians.

Skinning the Sable.

A returned traveller from the North tells me of a curious mode they have in Siberia of procuring the skin of the sable. Their fur is in the greatest perfection in the depth of winter, at which time the hunter proceeds to the forest armed with a pitcher of water and some carrion meat. He deposits the bait at the foot, and climbs to the top of a high tree. As soon as the animal attracted by the scent, arrives, the man drops some water on the tail and it instantaneously becomes frozen to the ground!—on which, descending from his elevation with incredible rapidity, his pursuer with a sharp knife cuts him traversely on the face. The sable, from the excess of pain, takes an extraordinary spring forward, runs off, and (his tail being fast to the ground) out of his skin of course, leaving it a prey to the hunter! Upon expressing a slight doubt as to the probability of this mode of skinning the animals, my friend assured me that he never could have believed it had he not frequently beheld it himself."—St. Petersburgh Journal.

[We are in the same position as that traveller was, before he "frequently beheld it himself."

The New Territories.

Despatches, we learn, have been received by our Government from California, stating that both these territories will be applicants to the next Congress for admission into the Union—The primary measures are now being taken to accomplish the object. New Mexico, with its population of 75,000 is already competent for admission, and the population of California is daily increasing. Its permanent population, by the next session of Congress, will no doubt be sufficient to demand the doors to be opened to its admission among the sister States.

The Great Caravan.

The St. Louis Reveille says that the whole number of wagons en route across the plains to California will make a train 55 miles in length. The same paper estimates the number of men now on their way to California, by this route, at 36,000.

An Owl in a queer place.

Two weeks ago an owl was captured by Mr Wm. King of Rochester, N. Y., in a very curious manner. The window of one of the rooms of his house was open, and a small child was in bed alone in the room, just before dark.—The child beginning to cry, some one went into the room to quiet it, and discovered the owl standing on one of the bed posts; and in and near the window were a considerable number of robins and other birds, which had evidently driven his owlship into his present confinement, and were guarding the window to prevent the escape of their enemy. Mr. King was called, and having shut the window, went into the room and caught and caged the bird.

By the last news from Europe the Hungarians were giving the despots a clean sweep.

Facts for Mechanics.

St. Paul was a mechanic; a tent-maker.—Our Savior was a mechanic; a carpenter.—The great Architect of the universe, in the mechanism of the heavens and the earth, with its productions, animate and inanimate, displays, a power and skill which human hands and human wisdom may attempt to imitate, but which they can never equal or approach.

Next to farmers, mechanics are the most numerous and the most important class of the community. Whatever promotes their interests, of course promotes the interests of the public. They, like farmers, have great facilities and great inducements to become men of science and sound knowledge. Every mechanic in every operation, brings into use some principles of science; which principle it is of course, his interest and his convenience to understand.

Every apprentice boy, no matter how assiduous or how rigorous his employment, if he spends a few minutes daily in useful reading and other modes of improvement, is certain to be a man of future influence and respectability. That apprentice who seeks most assiduously the interests of his employer, promotes most effectually his own interest; as character is the best capital a young man can have for the commencement of business.

Mechanics, like farmers, make safe and enlightened statesmen. They are well educated for legislators, and for other offices, because educated in schools of experience. Who can be better qualified to make laws for aiding the operations of business than those engaged in these operations.

English Supplies from the Black Sea, &c.

Southern Russia, lying on the borders of the Black Sea, raises vast quantities of wheat and grass. The British trade in that direction is increasing rapidly to supply their wants in provisions, and to supply those countries with British manufactures. In the years from 1825 to 1830, not more than 20 to 30 British vessels passed the Bosphorus straits for the Black Sea ports annually. In 1848 not less than 300 British vessels were engaged in that trade. They supply the people with British goods, and have driven American goods from those ports; and bring return cargoes of grain, butter, tallow, and hides.

England too, now receives from the Danube immense quantities of beef for her army and navy on contract, cured as follows; Bullocks there are raised at a very cheap rate in Wallachia and Moldavia, and sold alive at $12 to $15 a head. The hides, bones and horns, pay the cost. The beef is cut up in small pieces, the bones taken out, and put in small tight tin boxes with a little water, and no salt; a small hole only left in one corner of the box. They are set in a large iron vessel with water, and boiled until all the liquid in the boxes has escaped. The hole is then soldered up, and being thus left free of all air, the beef in them is known to keep as fresh as when it was put up. This ought to be remembered and tried.

Saying Grace in England.

Mr. Coleman in his European Life and Manners, says, that in England children even quite young are often called upon to say grace at the table, and that three days before he dined in a large and elegant party, where the lady of the house asked a blessing and returned thanks. He was a week at one house where the eldest daughter of a family, about twenty two, led in the family worship every morning, and constantly said grace at the table, and so in several other instances.

Mr. Colman has a strange faculty of observation. We expect that it is very seldom that children are called upon to say Grace in England any more than in the United States, and do not believe that the piety of the young ladies, is of a higher kind than that of our American *girls*, although the above would lead us to believe that *he did*.

Genius and Reality.

At a sale of choice autographs in London, a letter from James the Second "for my sonne Prince George of Denmark" in good condition with seal and silk—brought £2 12s. Two letters in the hand-writing of Keats, brought respectively £2 15s. and £2 17s. 6d. Truly science is a leveller.

Chinese Burial-Place.

No people profess so much veneration for the memory of their fathers as the Chinese; and the worship of their tombs is the most solemn, and apparently sincere, ceremonial in the shape of religious worship, they exhibit. In order to perform its rites, men (women take no part in it) who emigrate to distant lands often return, at much expense and trouble, to the place of their birth; and their fond clinging to the memory of the dead more than love for its institution seems, and is said to be, the strong bond that binds the Chinese to their country. But they have no consecrated place of interment; and if they have any rite analogous to episcopal consecration, it must be so simple and easily executed as to have effect any where. At any rate, they have no accumulation of graves in particular enclosed spots; they do not set apart a few acres for that purpose and surround them with walls, separating the silent tenants from the living world, and forming a great prison-house for the dead. On the other hand, every one chooses the spot he likes best for the final resting place of those he loved. The country residents bury their dead on their own land, often very close to their own dwellings. On the hill-sides, especially in stony, barren places, are seen tombs and graves, thinly scattered in rural districts and more numerous in the neighborhood of towns. The choice is wise, and its effects any thing but unpleasing to the eye. The tombs are often of porphyry, finished with some minute chiselling, and sometimes in tolerable monumental taste Placed on rocky eminences, often in particularly picturesque situations under the shadow of cedars and cypresses, they present every where objects of pleasing, perhaps profitable contemplation.

Do not Despise Small Things.

The possibility of a great change being introduced by very slight beginnings, may be illustrated by a tale which Lockman tells of a vizier, who having offended his master, was condemned to perpetual captivity in a lofty tower. At night his wife came to weep below his window. "Cease your grief," said the sage; "go home for the present and return hither when you have procured a live beetle, together with a little ghee (or buffalo's butter), three clews one of the finest silk, another of stout pack thread, another of whipcord; finally, a stout coil of rope." When she came again to the foot of the tower, provided according to her husband's commands, he directed her to touch the head of the insect with a little of the ghee, to tie one end of the silk thread around him, and to place the reptile on the wall of the tower. Seduced by the smell of the butter, which he conceived to be in store somewhere above him, the beetle continued to ascend till he reached the top and thus put the vizier in possession of the end of the thread, and drew up the packthread by means of the silk, the small cord by means of the packthread, and by means of the cord a stout rope capable of sustaining his weight—and so at last escaped from the place of his duresse.

Riches and Poverty.

That poverty is a real evil would be absurd to deny, and that it is the parent of many other evils, moral no less than physical, experience teaches and will for ever teach us. Not only that poverty which stands between its victims and the common comforts, also the necessaries, of life, is thus pregnant with sorrow and sin; but that which closes the access to every elegant enjoyment, and binds down to petty cares and anxieties the time, the thought, the whole spirit. But to believe that the reverse of all this in itself is happiness, is to have little experience indeed of life with all its varieties of pain and disappointment—of blighted hopes—of unavailing repentance. Some who have never known what it is to possess riches believe that the power of dispensing them must and does bring happiness; but in vain does "the widow's heart sing for joy" if no chord in the breast of her benefactor echoes to the sound of her rejoicings—if he feels that there are evils much worse than poverty. If personal regrets have closed the heart to sympathy, he may be benificent but the blessings of benificence do not return upon him.

National Convention of Inventors.--Patent Property.

A Convention of Inventors is called to assemble at Baltimore on the 21st of this month This meeting is called by a resolution passed at the Convention held in the same city in the month of last March. It will really be refreshing to the hearts of inventors, if the Convention, does *wisely, honestly* and well, something for their benefit. The first thing it should do, to ensure confidence in its purpose, is to guard against that kind of action which characterised the March Convention. There were some good men in it—men with the heart honest purpose of doing the inventor some service; but there were sharpers there also—men with a keen eye to number one, speculators in patents, and legal gentlemen who like Job's warhorse, "scented the battle afar off." It was a convention, that left a doubtful impression on the minds of many inventors, who knew the materials of which it was composed, respecting its *real objects*. Three lawyers were appointed to draft a code of New Patent Laws. They are men well qualified to construct technically a code of laws, but it is very doubtful, if they understand what inventors want. They will likely report at the coming Conventron.

A short time ago, the N. Y. Tribune, alluding to this convention, made use of the following language:—"One proposition that will or should be discussed at this Convention contemplates the protection of the property of Inventors from the depredations to which it is now exposed by the caprices of Jury Trial.—The ablest and most adroit lawyer is quite as essential in a patent-suit as the best case; and some verdicts have been given in glaring defiance alike of Law and Justice. The Inventors should endeavour to devise a remedy for this."

The above is a very unjust attack upon the intelligence and honesty of American Juries. Some wrong verdicts, no doubt, have been given by *Juries*, but more wrong decisions have been made by Judges. If a law was passed to-morrow, that would hedge around patent property, for fear of the results, from a fair investigation and Jury trial, as to inherent right in the property, we could, without assuming the air of a prophet, predict the abrogation of the whole patent system, in a few years. No unlawful monopoly must be tolerated in the Republic, and a Jury trial in a patent case, is merely "to decide whether the patentee is the real inventor, or not, or whether the defendant infringes the plaintiff's patent, or not, and according to circumstances, award damages. An intelligent Jury can decide best upon these things. Our inventors (patentees) want a law passed, that will save them from the expenses of *Law*. According to the present law, patent property is no less safe than other property, but the great evil lies in the expense of protecting it, from those who are dishonest enough to appropriate it to their own use. For example, the right of a patentee, according to the Law of 1836, can be contested in any District Court in the United States, as to priority of invention; and year after year, from Court to Court, he may have to defend his rights. In that case he would need to have a purse as deep and well filled as the Pacific Ocean. Now there should be some remedy for this. What shall it be? The law we think should be altered to allow one trial of Jury for priority, before a Circuit Court—then allow an appeal to the Supreme Court, to establish, or nullify the patent, and after this, allow no trial in any Court to contest priority. In cases, however, where the person complained of, as infringing on the *patent*, if there is not exact identity in the machines, and identity denied, we see no remedy but a fair Jury trial. This is no more than just. Every man must be protected in his rights.

There is a wrong opinion abroad respecting patent property. It is imagined by some that a man with a patent carries a crow on his back for every one to take a free shot at; or that it is a key to the District Court, plunging the poor patentee into a whirlpool of litigation from which like Nicholas the swimmer after the golden cup, in another element, he sinks to rise no more. Our Judges, *generally*, are willing to put the most favorable construction on a Patentee's Specification. It is true that there has been a great deal of patent litigation, and there will be. This is not to be wondered at, when we take into consideration, the great number of patents that are always in existence, but we venture to say, that there is less law suits respecting patent property, than any other kind. There are but few men so bold, as to defend in Court a brazen-faced piracy, or insidious infringement. There are some no doubt, who have done it, and there are others who will do it again, but their numbers are small.

New England Amusements.

"When I asked how it happened that in so populous and rich a city as Boston there was at present (October, 1845,) no regular theatre, I was told, among other reasons, that if I went into the houses of persons of the middle and even the humblest class, I should often find the father of a family, instead of seeking excitement in a shilling gallery, reading to his wife and four or five children, one of the best modern novels, which he has purchased for twenty-five cents; whereas, if they could all have left home, he could not for many times that sum have taken them to the play. They often buy, in two or more successive numbers of a penny newspaper, entire reprints of the tales of Dickens, Bulwer, or other popular writers.

"Dana, now a lawyer in Boston, and whose acquaintance I had the pleasure of making there, has, in his singularly interesting and original work, entitled "Two years before the Mast," not only disclosed to us a lively picture of life in the forecastle, but has shown incidentally how much a crew, composed of the most unpromising materials, rough and illiterate and recruited at random from the merchan service of different nations, could be improved by associating with a single well educated messmate. He was able, on one of the few holidays which were granted to them in California by the most tyrannical of captains, to keep them from going ashore, where they would have indulged in dissipation, by reading to them for hours Scott's historical tale of "Woodstock." We ought scarcely, then, to wonder, after what I have said of the common schools of this city, that crowded audiences should be drawn night after night, through the whole winter, in spite of frost and snow, from the class of laborers and mechanics, mingled with those of higher station, to listen with deep, intense interest to lectures on natural theology, zoology, geology, the writings of Shakspeare, the beauties of "Paradise Lost,' the peculiar excellencies of "Comus," and "Lycidas," treated in an elevated style by men who would be heard with pleasure by the most refined audiences in London.

[The above is from Lyell's recent work on the United States, and it presents a striking contrast, between the tastes, habits, and feelings of Americans, and those of other nations especially those who have been sodden with despotism for ages.

The Desert of Sahara.

North of the mountains of the Meon in Abyssinia lies the great Desert of Sahara stretching 800 miles in width from its southern margin, and 1000 in length between the Atlantic and the Red Sea. It is a hideous, barren waste, prolonged eastward into the Atlantic for miles, in the form of sand-banks, and interrupted to the west only by a few oases and the valley of the Nile.

This desert, is alternately scorched by heat and pinched by cold. The wind blows from the east nine months in the year, and at the equinoxes it rushes in a hurricane, driving the sand in clouds before it, producing the darkness of night at midday, and overwhelming caravans of men and animals in common destruction. Then the sand is heaped up in waves ever varying with the blast; even the atmosphere is of sand. The desolation of this dreary waste, boundless to the eye as the ocean, is terrific and sublime—the dry heated air is like a red vapor, the setting sun seems to be a volcanic fire, and at times the burning wind of the desert is the blast of death. There are many salt lakes to the north, and even the springs are of brine; thick incrustations of dazzling salt cover the ground, and the particles carried aloft by whirlwinds, flash in the sun like diamonds. Sand is not the only character of the desert, tracks of gravel and low bare rocks occur at times not less barren and dreary. On these interminable sands and rocks no animal, no insect, breaks the dread silence, not a tree nor a shrub is to be seen in this land without a shadow. In the glare of noon the air quivers with the heat reflected from the red sand, and in the night it is chilled in a clear sky sparkling under a host of stars.—Strangely but beautifully contrasted with these scorched solitudes is the narrow valley of the Nile, threading the desert for 1000 miles in emerald green, with its blue waters foaming in rapids among wild rocks, or quietly spreading in a calm stream amidst fields of corn and the august monuments of past ages.

Temperature of Water in High Pressure Steam Boilers.

The following table shows the heat of the water in high pressure boilers, when worked at from one to fifty atmospheres.

Pressure in Atmospheres.	Temperature in deg. of Fah.
1	212°
1½	233.96
2	250.52
2½	263.84
3	275.18
3½	285.08
4	293.72
4½	300.28
5	307.50
5½	314.24
6	320.36
6½	326.26
7	331.70
7½	336.86
8	341.78
9	350.78
10	358.88
11	366.85
12	374.00
13	380.66
14	386.94
15	392.86
16	398.48
17	403.82
18	408.92
19	413.78
20	418.46
21	422.96
22	427.28
23	431.42
24	435.56
25	439.34
30	457.16
35	472.73
40	486 59
45	491 14
50	510.60

If we are enabled to ascertain the heat of the water in the boiler, we have, by the above table, a ready means of ascertaining the pressure of the steam within the boiler. Let us suppose that the heat of the water is found to be 486½. On looking over the table we find opposite to this, the pressure equal to 40 atmospheres; this number multiplied by fifteen (the weight in pounds of the atmosphere, on a square inch of surface) will give the pressure against every square inch of the internal surface of the boiler thus—at 486½ the pressure in pounds on the square inch is 40X15 =600 pounds.

Boiling Springs of Iceland.

The Boiling Springs or aqueous eruption of Iceland, called Geysers, are among the most interesting phenomena in physicial geography, and have been ranked even among "the greatest wonders of the world."

These volcanic fountains are situated about 16 miles north of Skalholt, to the east of a small ridge, separated by a swamp from a group of high mountains. The principal fountains are the Great and Little Geysers and the Tunguhver. The Great Geyser rises from a cylindrical pipe or pit, 8 or 10 feet in diameter, and 75 feet in perpendicular depth, opening in the centre of a basin from 46 to 56 feet in diameter, and four feet deep. Hot water, having silex in solution, rises gradually through the pit till it runs over, depositing silicious matter at the bottom and round the cavity. When the basin is full, subterranean explosions, like the firing of distant cannon, are heard at intervals of some hours, accompanied with a tremulous motion of the ground. The water then rushes, up from the pit, and sinking again, agitates the water in the basin and causes it to overflow A stronger rush of water now takes place, clouds of vapor follow, and loud explosions are heard. Steam escapes in large quantities, and the water is thrown up to the height of 100 to 150 feet.—The cold air condenses the steam into vapor, which is tossed about in dense clouds, tumbling one over another with singular rapidity, and forming a sight of great interest and magnificence. When the basin, and its pipe are are thus emptied the explosions cease and are renewed after they have been again filled from below. Mr Henderson found the temperature of the water in the basin 203° before an explosion, and 183° after it. The New Geyser, or Strocker, 140 yards from the Geyser, is an irregularly shaped pit, nine feet in diameter and 44 deep. The water is seen in a state of great agitation about 20 feet below the orifice. At variable intervals a prodigious rush of steam issues with roaring noise; and so great is the force of propulsion, that the mass of vapor rises perpendicularly to the height of 100 and sometimes 200 feet, even when there is a good deal of wind. When large stones are thrown into the pit, they are shivered to pieces, and thrown upwards to a height often greatly exceeding that of the columns of vapor of water. In the valley of Reikholt is situated, among a great number of boiling springs the celebrated spring of Tunguhver; it consists of two cavities, distant only three feet, from which the water is ejected in alternate jets. While the water is thrown up from the cavity, in a narrow jet, 10 feet high, the water in the other cavity is in a state of violent ebullition. The narrow jet, after playing for about four minutes subsides, and the water in the other cavity instantly rises in a great column, to the height of three or four feet. After playing three minutes this greater jet subsides, and the other rises to repeat its singular alternations.

The general phenomena of the Geysers are obviously caused by the generation of steam in cavities containing water and of such a strength that when the steam occupies a certain space it overcomes the pressure of the water which is thrown out and followed by the steam. It is not easy however and has not been satisfactorily done, to explain the irregular alternations of the Tunguhver springs. Although the principal Geysers have been playing for 600 years, yet they are subjected to great changes arising from changes in the internal fires by which they are produced.—One of the springs which George Mackenzie mentions as very active when he visited the island in 1809, was found by Mr. Barrow to be extinct in 1834, and the surface of the neighborhood so changed, that the appearances described by the older travellers could not be recognized. In the same valley there is a small rock, from the top of which hot springs issue; and at Reikholt, the celebrated hot bath, excavated 600 years ago, Snorro Sturleson, is still to be seen. It is fourteen feet in diameter, and six feet deep, and is supplied with hot water from a spring 100 yards distant, by means of a covered channel, which has been injured by an earthquake, and by cold water from another neighboring fountain.

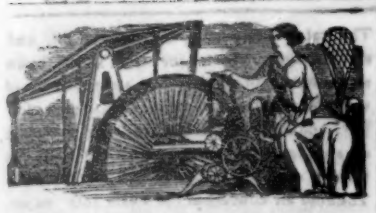
Ship and Whale Collision.

The packet ship Hibernia on her late voyage from this port to Liverpool while going through at a furious rate, struck full in the head an immense sperm whale, which flinging himself half out of the sea before he sought his depth, struck his assailant with his enormous flukes.

The whale was supposed to be instantly killed for the water around the ship's stern was completely discoloured with blood and oil.—No hurt was done to the ship.

It is supposed the whale she struck was either ill or sleeping on the surface. The oldest seaman in the Hibernia had never witnessed nor heard of a similar occurrence. For hours after this accident a solitary whale was seen roving aronnd our vessel, and spouting, doubtless in search of his murdered mate.

Many of the Virginia ladies have gone into mourning on account of the death of Mrs. Madson.



New Inventions.

Sanding Machine for Painters.

Mr. G. W. Maynard, of this city, has invented a very neat little machine for Sanding the fronts of houses, which is a most convenient instrument to the painter for the purpose. It consists of a small blower, in the front of which is placed a neat sand hopper, which communicates with the spout. By driving the crank handle of the blower, the sand is driven to, or on any part of the building the painter directs it. It is made to couple with a straight or curved spout, to direct the sand into the corners, &c. It can throw any quantity of sand on any particular spot, and it is therefore a most valuable acquisition to the art. It has proven itself to be this, as the inventor, who is a tradesman, has fairly and successfully tested it. Measures have been taken to secure a patent.

Improvement in Planing Machines.

Mr S. Hoyt, of Nashua, N H. has made an improvement in the reciprocating Planer, by combining it with a spring guard which holds the board firm to the action of the planing knife and thus prevents slivers being thrown out by the action of the plane when it comes in contact with knots, &c. He has tried his machine and it works with great satisfaction. He has taken measures to secure a patent.

Improvement on Shingle Machines.

A very small improvement is sometimes a very valuable one. It all depends on the universality and use of the machine. An improvement on the steam engine, or in the cotton manufacture, although it may be a very small one, yet if it saves two or three per cent, it becomes of extraordinary value. Mr. W. Wood, of Westport, Ct. has made a small improvement on the shingle machine, but it appears to be a valuable one. It consists in the mode of shifting the tail block and block of wood by the combination of an arm of the main axle that shifts the block to the required angle from side to side for every cut, as the block is moved forward. The plan is very simple and effects the object in a clever manner. He has taken measures to secure a patent.

The Fan and Fly Wheel.

Mr. J. F. Mascner, of Philadelphia, has taken measures to secure a patent for an improvement in machinery, of a combination of the fan wheel for clocks and the fly wheel used in steam engines, the same as is now in use in musical clocks, with this difference that it expands by an increase of speed and answers the purpose of a most excellent governor, and for some purposes it is better adapted than any other kind of arrangement of the fly or fan.

Improvement in Carriage Axles and Thimbles.

Mr. P. S. Eastman of New Hartford, Oneida County, N. Y., has made a very neat and useful improvement in securing the thimbles to the wooden axle by a long screw bolt passing directly through the small end of the thimble, on which the wheel nut is placed, into the end and through a hollow part of the axle in which there is a screw nut to receive the screw end of the bolt. In this simple way it forces the thimble or sleeve as it is sometimes called, on to the axle and holds it perfectly tight. The wheel nut is screwed on the thimble, and on inner end of the thimble there is a large circular flange which extends around the wheel-hub, and this with the screw nut outside of the wheel, most effectually excludes dust and mud from the interior of the wheel. Measures have been taken to secure a patent.

A new invention has been patented in England, an ever pointed pencil. Twelve leads can be fed one after another, to the point.

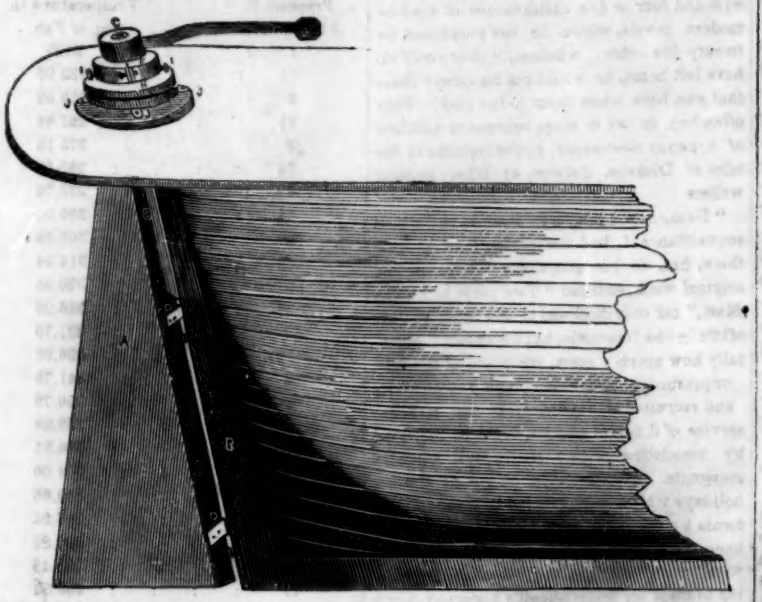
Liquid for Cleaning Metal Castings.

One of the first operations in cleaning metallic work after it comes from the casting or from the hammer, is to free it from the coat of oxide which adheres to it. This is done by keeping it for some time in water acidulated with sulphuric or muriatic acid. But there is one evil to which the metal is liable, in this way of removing the oxide, viz. the metal is liable to be attacked on its points, angles and edges. By combining creosote with the acid, this evil is said to be prevented. Napthaline and glycerine is as good as the creosote. The French remove the oxide from iron plates by steeping them in sour bran liquid. This we believe to be a most excellent process.—In the baths composed either of the acid and creosote, or the sour bran, the oxide is made to scale off without the metal being attacked. Therefore the castings can remain in the bath for a long time without any apprehension for the safety of the lines, points and figures.

To Unite Wrought and Cast Iron.

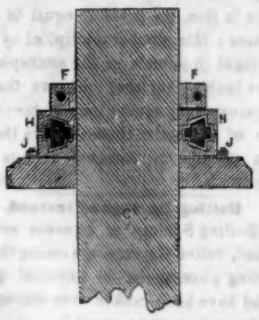
A cast iron and a wrought iron beam may be united by immersing the wrought iron beam in weak nitric acid ; then make it red hot, and plunge it into the weak bath of nitric acid again and free it from all the oxide that is upon it. It is then dipped in a weak solution of sal-ammoniac and immersed in a bath of melted tin until it is well tinned all over.—It is then coated, where it has to be united with the cast iron, with an alloy composed of copper 5 parts and tin 95 parts. It is then placed in a mould and made fast with tinned nails, when the cast iron in a molten state is poured into the mould, and a fusion takes place between the wrought and cast iron through the action of the interposed alloy. Steel and cast iron may be united in the same way.

IMPROVEMENT IN SHIPS' RUDDERS.---Figure 1.



This is an engraving of the invention of Capt. L. D. Gallup, of New London, Conn., to which we alluded last week. Fig. 1 represents its application to the rudder post, and fig. 2 is a vertical section, showing the inside. The same letters refer to like parts. The nature of the invention consists in combining a ring box with anti-friction rollers in it, to keep the weight of the rudder off the pintles, thereby making them to endure for a long time and to insure the free working of the rudder at all times, without any fears of its sagging in upon the stern post. This cut shows the patent rudder, to which this invention is applied.—A, is the rudder. B, is the stern post ; and C is the rudder post. D D, are the pintles, which couple the rudder to the stern post.—

Fig. 2.



In the old way all the weight of the rudder came on or was supported by the pintles, (bolt and socket joints.) By the continual motion of the rudder, the pintles endured but a short time and were very liable to get out of order. To remedy this evil is the object of this invention and this is done in the most simple and effectual manner. A ring anti-friction roller box is secured on deck. It is composed of three separate rings and a clasp. J, is the fixed ring. It has a groove which runs around it inside between two flanges. On the top of this lower ring is placed another ring. This ring has conical rollers fixed or cast in it. L L, fig. 2, show these rollers.—This ring is of a less diameter than the top or lower ring. J, is a top ring. It is formed exactly like the lower ring J, and these two rings (top and bottom,) H J, embrace the roller ring between them and form a ring box.—This ring box is coupled to the rudder post C, by a round metal clasp F, made in two pieces, which screw up tight on the rudder post; this clasp has two short stout arms I I, formed on it, which are received between two pins, or in grooves made for that purpose on the top of the ring H. It is therefore evident that the weight of the rudder is supported on the lower ring J, of the ring box, but it is supported in a most beautiful manner, viz. on the anti-friction rollers which along with the upper ring are allowed to move freely with the rudder post. This combination enables the rudder to be moved with great ease, while it is held snug and firm at the same time. A great number of these rings have been spoken for already, and there is not a nautical man who has seen it, and the number is not small, but has been delighted with it. Regarding the price, &c. more information may be obtained from the inventor, who has taken the usual measures to secure a patent.

Manufacture of Parchment.

Vellum is made of the skins of calves, kids and dead born lambs, and parchment is made of thin sheep and she goat skins. The wool or hair must be removed from them first, and then they are steeped in a pit of lime water. After they are taken out of the lime pit, they are shaved and well washed, and then stretched on a frame made of upright and cross pieces strongly fastened together, and the bars are perforated with a series of holes to receive hard wood or iron tapered pins. Each pin has a hole in it like a violin pin, to hold the string tied to the skin, to stretch it, and prevent it from puckering while drying. Skewers are also employed to stretch more or less of the skin on this frame, (*herse*) according as a greater or less piece is required to get hold of. Some employ hoops in place of the herse and this answers tolerably well. The great point is to stretch the skins as much as possible, keeping out all the wrinkles. While the skin is on the stretching frame, the workman with a currying double edged knife, removes the fleshy excresences by drawing the knife downwards. The skin is then sprinkled upon the fleshy side with chalk and well rubbed with a piece of flat pumice stone. The pumice stone is then rubbed over the other surface of the skin without chalk. The skin is then allowed to dry, but must be protected from sunshine and frost. It must not be dried too suddenly. When it is perfectly dry, the chalk is removed by rubbing it with the wooly side of a lambskin, but great care must be taken in this process, not to injure the surface. All grease must of necessity be removed from it, this is the object of steeping it in lime.

After the skin is dried it is transferred to a frame called the *scraper*, where it is extended with cords, generally upon a piece of calf skin well stretched. The skin is placed with the tail downwards, when the rough edges are pared off with a sharp knife and then the outside surface is scraped obliquely downwards till it becomes perfectly smooth, and whatever irregularities may remain, are removed by a flat smooth piece of pumice stone. To do this, the skin is placed upon a stool stuffed with wool and covered with soft parchment. It is called the *cushion*. The pumice stone should be very fine—the finer they are the better. Sometimes there are small holes made in the parchment skin ; these are neatly patched by cutting the edges thin and pasting on small pieces with gum water. Parchment is often colored green, which is done by a mixture of cream of tartar, verdigris and nitric acid, (only a small quantity of the latter.) It is made into a solution of water and laid on evenly with a sponge—the skin having been first wet. Parchment receives its necessary lustre from the white of eggs or weak gum water.

Georgia Burr Mill Stones.

The stone most commonly used for grinding wheat, is known by the name of "French Burr," because they are imported from that country. This species of stone, is a porous silicious mineral, so very hard, that a pair of millstones will last quite a number of years at full work, without being worn out. The French burr stones, owing to their great price, has from time to time stimulated both the Americans and the English, to many efforts to supersede them. During the last war between France and England, when it was impossible to get burr stones; the London Society of Arts offered a premium of a gold medal, or one hundred pounds for the discovery of a quarry producing stones equal to the French Burrs.—A quarry was discovered in Wales with stone similar to the French, and answered tolerably, but they were not equal to the French. A number of masses of rock were also discovered at Stirling, Scotland, and made into stones, some of which indeed gave better satisfaction than the French burr, as they were of a more even texture, but the French stone still carried the bell. In our country a substitute for it, has long been a desideratum. This has now been obtained. In Burke County, in the state of Georgia, a large quarry embracing an area of 17,000 acres has been discovered; and a Company named the La Fayette Burr Mill Stone Co., has been formed to work it and furnish American Mill Stones equal to the French Burr. The principle office of this Company is in Savannah. About 1,000 sets of stones have already been put up, and are now in operation, and some of them alongside of the French, where in every instance they have equalled—and a little more, the very best French Burrs Samples of this stone have been in our office for some. We have contrasted them in every way with French burrs, from which without knowing that the one came from France and the other from Georgia, no person could point out a difference. Those who have used the Georgia stone, prefer it for a more enduring fine sharpness, and in that case, it is more economical to use. From what we have seen of the Georgia stone, and heard about it from the most respectable sources, respecting its practical results, we are confident that the quarry must be of immense value.

It is stated by the Muncipal authorities of New Orleans, that the expenses incurred in stopping the great crevasse exceeded $90,000

NEW YORK, AUGUST 18, 1849.

To Our Subscribers.

Four numbers more will complete the present volume of the Scientific American. We hope that our subscribers will forward their subscriptions before the last number is issued, in order that we may transfer their names in season. We also hope that each subscriber will try and get another, to extend our circulation. It is true that our circulation is the largest of any other paper of the same nature in the world, but we should have a larger circulation than we have, and we will, if each subscriber, without any expense or outlay, just takes a little trouble to introduce our paper. Although we say this, as a request, we cannot but thank our subscribers for their kindness and interest in the welfare of the Scientific American. This is now our fourth volume; steadily have we increased in circulation, and with such an increase, we have added improvement after improvement, in the character of our paper. Let any subscriber take up the 1st, 2d and 3d volumes, and compare them with the present one, and the difference will at once be perceived. We want to add still greater improvements to volume 5, and our subscribers can enable us to do this The Scientific American is allowed on all hands, to occupy the foreground of all other periodicals, in disseminating interesting and useful information, promoting the cause of science, advocating the rights of the ingenious and industrious, and in presenting good engravings and descriptions of new inventions, and illustrations of operations in the sciences and arts, and it does so in the plainest and most common sense manner. We know that business has not been very brisk this summer, but there is no man but can pay the amount of our subscription, almost at any moment. No man who has the ambition to keep up with the intelligence of the age, can be without it. All the valuable home and foreign scientific news, first finds its way into our columns. We possess the best means of obtaining the most recent information on patents, inventions and discoveries in science and art. Therefore every person who would consult his own interest should subscribe now for volume 5 of the Scientific American.

With this number we send our prospectus. Those who publish it, will be pleased to mark the advertisement, and if they fail to receive the Scientific American through some oversight, we hope that they will let us know of the same. A few mistakes of this kind have occurred with us, but none of them intentional, and we always regret when any thing of the kind does take place.

Horse Power of Engines and the Economy of working Steam Expansively.

Since the practice of working steam expansively has come into use, the problem of calculating the power of an engine has become somewhat more intricate.

When the steam was admitted during the whole stroke, the pressure on the piston was allowed to be the same as in the boiler, but to obtain the mean effective pressure when the steam acts expansively becomes a subject of calculation; after this result is obtained the process of calculating the power becomes quite simple, as heretofore.

Since it is the same for estimating the power of all engines, the results must of course be similar, hence it is not in the process, that engineers differ so much in their results.

33,000 is now universally received as a divisor in this country, consequently the disagreement must arise in the per cent loss due to escape and condensed steam, difference in the pressure in the boiler and on the piston, friction of the engine, &c.

Now if some definite per cent loss should be universally received, engineers would all agree in their results. It is customary with some of the first shops in this country, and many in Great Britain, to deduct 40 per cent or take 60 per cent from the theoretical results.

If this practice was universally observed by engineers, we should be able to obtain and establish the number of horse power required to drive all the various kinds of machinery.

The first inquiry of a purchaser is, what number of horse power is required to drive his work. Such information (if obtained from different shops) seldom agrees.

The first class engine builders in this country, have now arrived to such a degree of perfection in building engines, that there is no practical difference in the amount of power which the same sized engines are capable of transmitting, hence the crude opinion that has existed since the early history of the engine, that no two engines can be made to perform alike, or to produce the same effect, should, and ought to be entirely disregarded.

ECONOMY OF EXPANSION.

Whether the idea of working steam expansively was suggested by the fact, (which is alike discoverable by all) that the force of steam is not much, if any reduced, by passing through the cylinder, or whether it was deduced by theoretical investigation, is of little importance, but we obtain results by theory which would require a long time to be established by practice.

It is of course understood, the earlier the supply of steam is cut off, the less the mean effective pressure, hence to produce the same effect, the area of the cylinder must be proportionately larger. It will not, however, be necessary to increase the size of the boilers, but they may on the contrary be decreased as the consumption of steam is less. It would require too much space in your paper to enter into a calculation to show these relations. We will, however, give the result of a calculation showing the economy in fuel derived from expansion. It will of course be understood, that the quantity of fuel consumed, will vary as the quantity of steam expended.

We will select a cylinder 4 feet in length and 1 foot area. In the first instance, we will allow the pressure of steam in the cylinder to be the same as in the boiler, which we will suppose to be 40 pounds per square inch. After this we will cut off the supply at 3-4, 1-2 and 1-4 respectively, then the quantity of steam expended during each stroke of the piston, will be respectively 4, 3, 2 and 1 cubic feet and the effect produced from each of these quantities of steam will be 40, 38 68-100, 34 8-100 and 24 28-100 pounds. Now it is quite certain that the quantity of fuel consumed will vary as the quantity of steam produced, hence the quantity of fuel consumed will vary as the effect produced and the consumption of steam jointly, which when resolved, gives the following quantity of fuel required to produce the same effect in all the different cases. 100, 77, 58 and 41 pounds. This is 100 pounds of coal produces no greater effect when the steam does not act expansively than 41 pounds does when the steam is cut off at 1-4 of the stroke or when the piston has moved 9 inches.

The great difference in the quantity of fuel consumed is due to the difference in the pressure of the steam when it leaves the cylinder. In the first instance it left under a pressure of 40 pounds per inch, of course possessing great mechanical power which is entirely lost, when cut off at 1-4 stroke it leaves the cylinder, (according to Marriott's law, not taking into account the difference in density due to the change of temperature) under a pressure of 10 pounds. There is a limit, however, beyond which expansion cannot be carried to advantage.

Tredgold justly remarks that the final pressure should never be less than that required to overcome the friction of the engine, for if it should be carried beyond this, there would be a moment at the end of each stroke, in which the motive power of the engine would be entirely withdrawn.

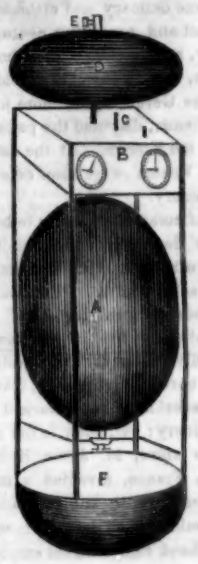
The final pressure on the non-condensing engine should not be less than 8 or 10 pounds, this would admit steam of 60 pounds to be cut off at about 1-6 of the stroke, quite early enough. With the condensing engine the final pressure may be carried as low as 3 or 4 pounds because there is a vacuum of 14 pounds to be added. Here the advantage of the condensing over the high pressure engine becomes striking.

C. E. L.

New York Mechanics Institute.

This Institute has been removed from the old miserable cellar in the City Hall, to No. 105 Bowery, (between Hester and Grand sts.) where rooms have been fitted up, which for neatness and utility, greatly excel those which the Institute has hitherto occupied. The Reading Room, as formerly, will be supplied with all the newspapers and Magazines of respectability. Extensive additions to the Library are being made, and a programme of a course of interesting and instructive Lectures to be given during the approaching fall and winter, is under consideration. We hope that our mechanics will for their own credit sake resuscitate this Institution and place it upon a splendid and permanent basis. Here in a great city with nearly half a million of inhabitants, we have not been able to support a Mechanics Institute well. Our mechanics should awake to some sense of their culpable negligence in reference to their own honor. We would like if employers would give their influence in this cause. If *they* looked to the greater respectability of their apprentices and journeymen, for belonging to such an institution, the same as our merchants look upon their clerks who are members of the Mercantile Association, we would soon see a flourishing Mechanics Institute in this city.

Apparatus for Deep Sea Sounding.



A, is a copper receiver for holding condensed air. B, is an air tight box containing a lock for opening the air valves, the trigger for that purpose passing through a collar of leathers to the outside at C, and a time piece with two faces, the pointer of one face to be stopped by the mainspring of the lock, the moment the machine arrives at the bottom; and the time piece to be stopped the moment the machine is drawn back to the surface of the water. D, is a flexible receiver for holding the air in a more expanded form, to reverse the specific gravity. E, is a pipe upon which the receiver is folded during its descent to prevent the too rapid descent of the machine. F, is a piece of metal attached to the machine by four rods which slide up and down about two inches. A quantity of air is let into the receiver and the machine is then let down into the water, when the weight F, touches the bottom and the trigger C, strikes D, and stops one time piece, and then when the machine reaches the top the other time piece is stopped. Thus the one time piece would check the other in relation to the time of ascent and descent. A line does not of itself give an accurate measurement of distance from the surface after a certain depth. E. J.

Tobacco a good Protection for Hot House Plants.

In England tobacco is used to fumigate the plants in hot houses to free them from numerous amphides that are so destructive to the tender plants. The tobacco is cultivated there for that purpose and has been found to be the only safe remedy. Many smoke the leaves of household plants for this purpose.

German Silver.

This metal is composed of one part of nickel, one part of spelter or zinc, and three parts of copper; but all these substances have to be pure, and be exposed to a great heat before they mix among themselves. The zinc metal, which is of a volatile nature, is not put into the pot until after the first two metals have been well united together. The refractory nature of nickel and the difficulty of obtaining the metal free of arsenic, iron and cobalt are causes that not unfrequently we see German silver spoons of gold yellow color, while German silver prepared from pure metals, will equal in whiteness sterling silver, and will not tarnish. Tea and table spoons knives and forks, pocket combs, musical and surgical instruments, firemen's and ship captain's speaking trumpets, pocket book clasps, tea sets, lamps, and gun mountings, are now mostly made with German Silver. Upwards of 50,000 lbs. of this composition is manufactured in this country annually, for which the nickel is imported from Germany and England. There are but three localities of nickel ore in this country;—an ore from Chatham, in Connecticut, yields about three per cent nickel; another ore from the mine La Motte, in Missouri, yields about ten per cent nickel; and lately a nickel ore has been discovered among the copper ore on Lake Superior.

German silver was introduced into the United States by Dr. Feuchtwanger of New York, who was obliged to pay on his arrival in this country, the custom-house duties of silver, the inspectors not knowing any difference.—He is the first manufacturer of the German silver in the United States.

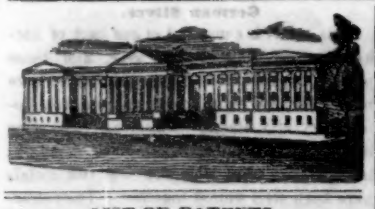
In 1837, the Doctor petitioned Congress to grant him permission of issuing $30,000 worth of pennies made of his composition, as an experiment to substitute the German silver for the copper currency; and Mr. John Quincy Adams in the House and Mr. Benton of the Senate, spoke in the highest terms of this proposition, and it met with the approbation of the President of the United States, Mr. Van Buren, and the members of both Houses. He failed, nevertheless, in that also on account of the unfavorable report from the Director of the United States Mint, who stated that the right of coinage belongs to the United States government, and that it required some skill to analyze the German silver.

Remarkable Statement about Cholera.

An eminent physician of Paris, Dr. Ronet, has written to a professional brother in Liverpool, statements so startling in reference to the results of a very simple mode of treating in the worst stage, the disease now so fatally prevalent in Paris, that we deem it our duty at once to lay it before the public. The letter, of which the following is a translation, is dated Paris June 18:—"I think it my duty to inform my professional brethren, that in a great number of patients affected with cholera in the last stage, that is to say when the pulse is absent, and in the commencement of the blue stage, I have succeeded in restoring the action of the heart and recovering the patient from the blue stage by administering at intervals of half an hour four cups of a hot and sweetened infusion of the common lime tree, mint, balm or chamomile, &c. in each of which cup of infusion were four drops of volatile alkali, making 16 drops, which the patient may take in two hours. The reaction is almost instantaneous. The pulse commences instantaneously to beat, rather irregularly at first it is true, but afterwards with force; the blue state disappears; the body, face and extremities are covered with hot and copious sweat, and in a few hours the patient is entirely out of danger. It is frequently necessary to combat the reaction when it becomes too strong, by the assistance of bleeding."

One of our Generals residing in Washington in affluent circumstances, has been wise enough to learn his well educated son a trade, and the youth, with all the true dignity of one of nature's noblemen, is wielding the axe and jack plane This is a noble novelty which merits commendation. "Give a boy a trade and you give him an estate."

Gum camphor laid in the track of ants is said to be excellent for keeping away these troublesome insects.



LIST OF PATENTS.

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending August 7, 1849.

To Thomas Davison, of New York City, for improvement in Salting Meats. Patented August 7, 1849.

To Horatio G. Sickel, of Philadelphia, Pa., for improvement in Gas Lamps. Patented August 7, 1849.

To John G. Webb, of Williamsburg, N. Y. for improvement in Argand Burners for Gas Lamps. Patented August 7, 1849.

To Andrew Walker, jr. of Burke, Vt., for improvement in Gas Apparatus. Patented August 7, 1849.

To Sylvester Billings, of Spring Garden, Pa. for improvement in Blocks for setting Hat Brims. Patented August 7, 1849.

To Charles Atwood, of Derby, Conn., for improvement in securing Hooks and Eyes to Tape and Dresses. Patented August 7, 1849.

To J. H. Robinson, of Charlestown, Mass. for improvement in Pessaries. Patented August 7, 1849.

To Henry Miller, of South Bend, Ind., for improvement in Bedstead Fastenings. Patented August 7, 1849.

To Munson C. Cronk, of Auburn, N. Y. for improvement in cleansing Bottles. Patented August 7, 1849.

To Willard Twitchell, of Syracuse, N. Y. for arrangement of weight and pulley for closing Gates. Patented August 7, 1849.

To John Murphy, of Kensington, Pa., for improved method of regulating the contraction of Car Wheels. Patented August 7, 1849.

To William Van Anden, of Trenton, N. J. for Machine for making Springs of Wire.—Patented August 7, 1849.

To Josiah Hayden, of Williamsburg and Rufus Hyde, of Chesterfield, Mass., for improvement in manufacture of Button Moulds. Patented August 7, 1849.

To Peter H. Niles, of Boston, Mass., for Eccentric Piano Lock. Patented August 7, 1849.

To Josiah F. Flagg, of Boston, Mass., for improvements in Locomotive Spark Arresters and Smoke Conductors. Patented August 7, 1849.

To Nicholas Mason, of Roxbury, Mass., for improvement in Cooking Stoves. Patented August 7, 1849.

To Edward Munson, of Utica, N. Y. for improvement in forming and balancing Millstones. Patented August 7, 1849.

To George P. Tewksbury, of Boston, Mass. for Reversible Life Boat. Patented August 7, 1849.

RE-ISSUE.

To Henry G. Tyer and John Helm, of New Brunswick, N. J. for improvement in the manufacture of India Rubber Goods by means of Zinc compounds. Patented January 30, 1849. Re-issued August 7, 1849.

DESIGN.

To Joseph G. Lamb and Conrad Harris, of Cincinnati, Ohio, for Design for Stoves. Patented August 7, 1849.

Wilson, the Vocalist.

The New York Mirror says that Mr. Wilson, the vocalist, who recently died at Montreal of cholera, was originally compositor in the printing office of Ballantyne & Co., Edinburgh; and in that capacity he put into type some of the earliest novels of the "great Unknown." Having a taste for music and a very fine voice, he became celebrated as a ballad-singer, as well as an operatic performer. He first came to this country with Miss Shirreff and the Seguins, and appeared at the Leonard street Theatre, then under the management of James Wallack. After an absence of several years, he returned to this country last fall, accompanied by one of his daughters who had acted as pianist at his musical entertainments, and who, by this bereavement, is left under peculiarly melancholy circumstances.

Embroidery.—Hand and Power.

(*Concluded.*)

The beautiful embroideries on muslin, with cotton, by the Indian and Candian women, are well known. The embroidery practised by the latter is curious enough: they work with their own hair, as well as that of animals, with which they make splendid representations of flowers, foliage, &c.

The negresses of Senegal, before their marriage, embroider the skins of various beasts, representing figures, flowers, and animals, in every variety of colour; and the pictures thus formed, they present as trophies of their skill to their husbands, on the morning (before sunrise) of the ninth day after marriage.

The Georgians and particularly the Turkish women, are renowned for their embroideries on the lightest and most delicate materials, such as crape and gauze, which they ornament with gold thread in a manner unequalled. Their embroideries on morrocco leather have long been esteemed, on which they work the smallest objects in gold, passing without fraying the thread. The Greek women of the present day, and the inhabitants of the islands of the Levant, are celebrated for their embroidery, principally of gold and silver. The women of Therapia on the Bosphorous excel in a most beautiful description of work: It can scarcely however, be termed embroidery, being rather a species of exquisitely fine netting. They represent flowers in relief, every petal of which is worked with the utmost exactness. These extraordinary productions of the needle, cannot be sufficiently admired for their extreme delicacy and elaborateness.

In the last and preceding centuries, when embroidery, as an article of dress both for men and women, was an object of considerable importance, the Germans, but more particularly those of Vienna, disputed the palm of excellence with the French. At the same period, Milan and Venice were also celebrated for their embroidery.

The art of embroidery seems to have attained a higher degree of perfection in France, than in any other country:—it is not, however, so much practised now. Embroiderers formerly composed a great portion of the working population of the largest towns; laws were specially framed for their protection.

It would have been supposed, that embroidery could never have been worked with profit by machinery; yet, such is the case. But a few years since, M. Josue Heilmann, of Mulhausen, France, invented a machine by which a female, with the assistance of two children, could turn off daily as much work as 20 expert hand embroiderers employed upon the common frame.

Within a few years, a number of machines for embroidering and sewing, have been invented, but nothing in the embroidery line, has as yet been able to compete with hand labor. In the North of Ireland and the West of Scotland, the females are celebrated for their skill in embroidery. The French perform finer work, but are very slow in comparison with their Island rivals. In Paisly a celebrated manufacturing town in the West of Scotland, the females are unrivalled for skill in embroidery. Many articles of dress purporting to be pure Chinese, are produced there, and surely, it is to be expected, for civilization should bring skill to the hand along with knowledge to the head, and in that manufacturing place, the skill of the needle is highly cultivated, and so is the knowledge of the head, by a fine school of design, where drawing of the highest style is taught, and a very pure taste cultivated.

Starch in Fern Plants.

Ferns (bracken) the *cryptagameous* of botanists have long been known as possessing excellent properties for a litter, or in many instances for all the purposes of straw especially among the poor in wild regions. It grows abundantly in half cleared woodlands in our country and apparently where nothing else can grow. In Lapland the deers feed on a kind of moss which is very nutritive and in many parts of the world the inhabitants make food out of plants, which with us, are allowed "to waste their fragrance on the desert air." In no country however, is there use made of the fern plant, as an article of food, and indeed, there is no plant so unprepossessing in every way, to deceive mankind in this respect, yet in the hands of science, it can be made to yield food to man in no inconsiderable quantity.

Some years ago M. Morin analyzed the fern plant and found the root to contain a fatty substance of a nauseous odour and disagreeable taste, heavier than water; gallic and acetic acids, uncrystallizable sugar, starch, tannin, and a variety of gelatine insoluble in water and alcohol. He also found in it, subcarbonate, sulphate and hydrochlorate of potassa, carbonate and phosphate of lime, alumine, silex and oxide of iron. Since that time it has been further analyzed and found to contain principally out of 7000 parts of roots and stems, starch 760, gallic acid 30, tannin 50 parts. If a quantity of the stems or roots of the fern are grated down and diffused in water, and then placed upon a thin cloth filter and washed well with water, the fluid passing through the filter, will contain the whole of the available starch of the plant. If this solution is permitted to stand undisturbed for some time, the starch will be precipitated to the bottom of the containing vessel; when washed and well dried, this forms pure starch.

If a small portion of the starch is mixed in water in a test glass, and a solution of iodine poured into it, a fine blue color, the characteristic test of starch, will be produced.

The addition of a solution of the persulphate of iron, to the liquid poured from the starch, produces a black color, indicating the presence of gallic acid in the liquid, forming gall of iron. Crystals of gallic acid may also be produced by evaporating the waste liquid to a third or fourth of its original quantity, and allowing it to stand for two or three weeks.

Arab Women and Arab Workmen.

When I first employed the Arabs, (says Layard, in his "Nineveh and its Remains,") the women were sorely ill-treated and subjected to great hardships. I endeavored to introduce some reform in their domestic arrangements, and punished severely those who inflicted corporal punishment on their wives. In a short time the number of domestic quarrels was greatly reduced, and the women, who were at first afraid to complain of their husbands now boldly appealed to my protection. They had however, some misgivings as to the future, which were thus expressed by a deputation: "O, Bey! we are your sacrifice. May God reward you. Have we not eaten wheat bread, and even meal and butter, since we have been under thy shadow? Is there one of us that has not a colored hankerchief for her head, bracelets and ankle rings, and a striped cloak? But what shall we do when you leave us?" These poor creatures, like all Arab women, were exposed to constant hardships. They were obliged to look after the children, to make the bread, to fetch water, and cut wood, which they brought home from afar on their heads. Moreover, they were intrusted with all the domestic duties, wove their wool and goat's hair into clothes, carpets, and tent canvass; and were left to strike and raise tents, and to load and unload the beasts of burden, when they change their camping ground. If their husbands possessed sheep or cows, they had to drive them to the pastures, and to milk them at night. When moving, they carried their children at their backs during the march, and were even troubled with this burden when employed in their domestic occupations, if the children were too young to be left alone. The men sat indolently by, smoking their pipes, or listening to a trifling story from some stray Arab of the desert who was always there to collect a group around him. At first, the women, whose husbands encamped on the mound, brought water from the river; but I released them from this labor, by employing horses and donkeys in the work. The weight of a large sheep or goat's skin filled with water is not inconsiderable. This is hung on the back by cords strapped over the shoulders, and upon it, in addition, was frequently seated the child, who could not be left in the tent, or was unable to follow its mother on foot. The bundles of firewood brought from a considerable distance were enormous, completely concealed the head and shoulders of those who tottered beneath them. And yet the women worked cheerfully, and it was seldom that their husbands had to complain of their idleness. Some were more active than others. There was a young girl named Hadla who particularly distinguished herself, and was consequently sought in marriage by all the men. Her features were handsome, and her form erect and exceedingly graceful. She carried the largest burdens, was never unemployed, and was accustomed, when she had finished the work imposed upon her by her mother, to assist her neighbors in completing theirs.

Form and Density of the Globe.

Mathematical calculation and actual admeasurement both give us this testimony that it is not a perfect sphere, but flattened at the Poles, so as to constitute an oblate spheroid.—The history of the sciences, says Humboldt, presents us with no problem second in importance to that which seeks to discover the figure of the earth. The results of the different plans employed, differ to some extent, but the circumference measured round the poles is usually stated as one-299th less than that measured round the equator, in other words the earth bulges at the equator to something like 4½ times the height of Mount Blanc. If this globe were a mass of water, the figure impressed upon it by rotation round an axis would be a regular oblate spheroid, but though the original fluidity of our planet is shown by its oblate figure, (oblateness resulting from the operation of a centrifugal force on a rotating mass,) yet the true shape stands in the same relation to a regular figure as the uneven surface of ruffled stands to the even surface of unruffled water. Our earth has not only been measured, it has been weighed also. The latest researches give its mean density 5.44, that is, the earth is very nearly 5½ times denser than pure water. Now, as the mean density of the mineral matter constituting the crust is only 2.7; and the mean density of that crust and the ocean, is no more than 1.6, we see at once how vastly the density of the interior must be increased by pressure or some other cause. We have penetrated no further than 2000 feet below the sea's level, or one 9800th of the distance between the surface and the centre. No doubt our knowledge of the contents of the earth extends to a much greater depth, for some of the chrystaline matters thrown up by volcanoes come from a depth many times greater than that which man has reached; and by the contortions of strata we are made acquainted with substances which, if no throes had disturbed their repose, would have been lying at least 12,000 feet beneath our feet. There is a regularly progressive increase of temperature with an increase of depth, and the discharge of molten minerals through gaps in the surface, declare plainly that there is an enormous heat kept alive below. The warmth of the sun is communicated at a slow rate, and to a short depth only to the earth, and there are points where the temperature is always the same. Between the parallels of 48° and 52°, on the continent of Europe the stratum of invariable temperature occurs at from 55 to 60 feet deep, whilst in tropical climates it is found at no more than a foot below the surface.

The Habit of Reading.

The young should always cultivate a habit of reading, for it may be to them, not only the means of information, but the perennial source of many of the finest enjoyments of life. They who make good books their constant companions, will never want good and faithful friends in their prosperous days, or those who will sympathise in the seasons of reverse. There can be no blank in the lives of those persons, who, from active love, hold daily fellowship with the wisest and best of their race. We think we could hardly be tempted to exchange our habit of reading for any other friend it may be our fortune to find on earth. And we are sure that any who will make this habit a friend, will ever esteem it among the wisest steps of their lives and so we counsel the young, from our own experience, among all their gettings in this world, to getting the habit, the love of reading—and always to have at hand a good book with which to fill up every leisure hour. In this way they may come to know that the gems of life are found in its waste places.

TO CORRESPONDENTS.

"R. M. C. of Mass."—According to Rennie's experiments, a bar of cast iron one inch square cast horizontal supported a weight of 18,656 lbs. and one cast vertical supported a weight of 19,488 lbs. You may judge from these experiments what to do.

"J. W. of N. Y."—There is something for you on our editorial page.

"Bramble Brae of Va. "—We will write to you next week. Circumstances have prevented an answer before this, to your last letter.

"T. B. of N. Y."—We do not know what to say about your case. It is hard that an inventor should benefit another by his invention and then be used unjustly by him. Make him pay up. If the case was known it would create sympathy for you.

"S. T. of Ohio."—Your letter is too long and it is not written plain enough for publication. The truth is we cannot afford time to decipher it. Many persons of first rate abilities are too careless of their penmanship.

"J. W. O. of N. Y."—Your article has been read and will be published in our next number. Please forward your advertisement and we will give it an insertion. The residence of Mr P. is unknown to us—he has not been in the city for some time past.

"R. L. of Mass."—We cannot tell exactly what it will cost to obtain what you desire, as the copy of specifications, costs so much per 100 words, and the drawings will have to be done in Washington. We should think that $15, would be sufficient. If you will remit that amount, we will attend to it.

"A. D. of La."—Your communication has been attended to. Louisiana money taken at par for subscriptions.

"G. W. H. of R. I."—Yours has just come to hand. It will appear next week.

"E. D. of Mich."—We can supply you with vol. 3, bound $2,75, that is all we have.

"G. J. of Ohio."—We cannot publish what you desire under any circumstances, it would require too much space in our paper.

"J. M. T. of N. Y.—We cannot give you the address of Mr. Remington. If you have been a constant reader of our paper, you could not have failed to notice the remarks which we made about Mr. Remington's Bridge.

"W. C. K. of N. H."—Minifie's Mechanical Drawing Book is the best adapted to your wants. Price $3. To be had at this office.

"S. W. of N. Y."—You had better forward us your model and we will examine it in comparison with the one you name and report to you.

"W. T. & G. A G. of Pa."—Your letter of the 10th, is received. Your machine seems to possess some new ideas, and if you will send us on a model accompanied with the patent fee $30, we will make out your papers.

"C. C. L. of Pa."—We believe that the Commissioner of Patents will give his influence to any proposed reasonable measure that has for its object the advancement of science and art, and the interest of inventors.

"J. M. D. of Geo."—Your communication of the 4th inst. has been received. We cannot arrive at a clear understanding of the nature of your invention without either a drawing or a model, which you had better send us at you earliest convenience and we will inform you by letter our opinion of its merits.

"J. C. T. of Ohio.—You will find an engraving and description of the self-acting brake in No. 41 of the Scientific American precisely like yours.

"T. O. B. of Ala."—You had better save your money and not throw it away on what has been fully tried and proved useless. You could not get a patent.

"H. B. of N. Y."—The best thing you can do, is to get an engraving of your patent machine published in the Scientific American.—It will put money in your pocket and will only cost you $8. What does the world know about it now ? Nothing. Every patentee should do this, if he would consult his own interest.

"L. R. of Mass."—When a machine can be made to go without friction, then you may construct an endless moving clock, not otherwise.

"J. S. of Phil."—The Lithographic Press to which you refer was patented in 1847. It is used in London. Mr. W. Smart, of Leather Lane, Middlesex, is the inventor. We know of no improvements on them since that time.

"R. McN. of N. C."—You can assuredly get a patent. We speak confidently.

"B. H. of N. H., L. D. G. of Ct., D. V. of N. Y."--Your specifications and drawings have been forwarded to the Patent Office since our last issue.

Messrs. De Graff & Kendrick of Detroit, will please write us as soon as convenient, in relation to the business we have with them.—We have written them two letters and have received no answer.

Money received on account of Patent Office business since August 9 :—

B. H. of N. H, $20. A. D. B. of Geo. $30. G. & W. of Ct. $20. J. F. M. of Phila. $30. P. S. E. of N. Y. $28. G. W. M. of N. Y. $54. D. V. of N. Y. $15.

Wool Growing in Illinois.

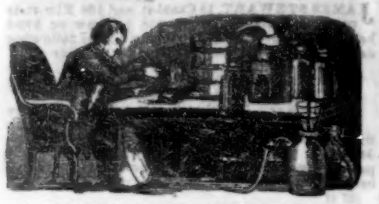
The Peoria Register gives a good account of the sheep pastures of that part of Illinois.—They are becoming numerously stocked, with very superior qualities of sheep. The entire number of head in the country is stated at 30,000, and the wool clip of the past spring at 90,000 lbs. The venerable Bishop Chase is one of the chief wool growers of that immediate vicinity, owning a flock of 20,000 head. C. Stone also has a flock of the same size, and there are several other flocks of 1100 to 1500 head.

The Maryland Tobacco Crop.

The Marlboro' Gazette states that some planters will scarcely make tobacco enough for their own consumption. The corn is looking tolerable well.

The Capitol of Ohio, now in progress of erection will be one of the largest and noblest piles in the Union. It is of a dressed stone, 304 feet by 184, covers a surface of 55,936 square feet. The Capitol at Washington is not much larger, as it covers a surface of about 61,790 square feet.

Advertisements.



For the Scientific American.

Artificial Gems.

False Pearls are made by dissolving the scales of small river fish in water of ammonia, which solution is dropped into the inside of hollow glass beads, and then allowed to dry. These are called paste beads, but the French have a way of counterfeiting the real pearl, so skilfully as almost to deceive a *connoisseur*. The basis of all artificial gems is a fusible glass called Strass paste. It is made of rock crystal six ounces, red lead nine ounces, pearl ash three ounces, boracic acid half an ounce, and arsenic five grains This is mixed (being first ground) then fused in a Hessian crucible and kept fused for 24 hours, and then left to cool gradually. The following artificial gems are made of this Strass paste combined with different substances for the various colors.

For Amethyst.—Strass paste one pound, oxide of manganese 24 grains, cobalt 1 grain, fuse together. By the addition of a grain of cassius purple, a more beautiful gem will be made.

Beryl.—9 ounces Strass paste, antimony 24 grains, cobalt one and a half grains. Fuse them together in a crucible.

Red Cornelian.—Strass paste 2 pounds, glass of antimony one pound, calcined peroxide of iron two ounces, and one drachm of oxide of manganese.

White Cornelian.—Strass paste 2 pounds, burned bones one ounce, and a mite of washed yellow ochre.

Emerald.—Strass paste 1 pound 6½ ounces, acetate of copper 72 grains and 1½ grains peroxide of iron.

Another emerald may be made by 9 ounces of Strass paste, oxide of copper 39 grains, oxide of chrome two grains.

Garnet.—Strass paste 1 ounce, glass of antimony 210 grains, and oxide of antimony 2 grains. By adding 2 grains of cassius purple a more beautiful garnet is produced.

Opal.—Strass paste 10 lbs., burned bones half a pound

Ruby.—Strass paste 16 ounces, cassius purple 168 grains, the same amount each of peroxide of iron, and of golden sulphuret of antimony, and of manganese burned with nitre, along with two ounces of rock crystal. A A small amount of manganese with 5 ounces of Strass paste makes a very fine ruby.

Sapphire.—Strass paste 1 ounce, cobalt 68 grains. Fuse for 30 hours. By adding a few grains of manganese a different shade is produced. This mixture must be carefully mixed before fusion and left 30 hours in the fire.

All these artificial gems are fused in luted Hessian crucioles and kept in the fire from 25 to 30 hours. They are then suffered to cool gradually.

Hydrogen.

No. 1.

Hydrogen is a gas and is the lightest of all known substances, a cubic inch at mean temperature and pressure, weighing only 0.0213 of a grain; compared with atmospheric air its weight is as 1 to 15 2. In consequence of this extreme lightness it was used formerly for inflating balloons, but, on account of the expense of obtaining it in sufficient quanty, coal gas (a compound of carbon, or charcoal, and hydrogen) is now substituted for pure hydrogen; much more of this gas, however, is required to carry a given weight for it is much heavier than pure hydrogen.

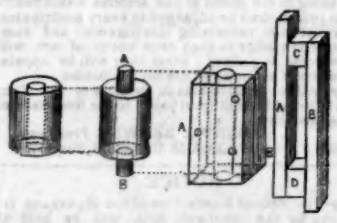
Dry hydrogen gas when it comes into contact with the oxides of many of the metals at a high temperature, decomposes them; the hydrogen uniting with the oxygen to form water which passes off as steam; and the oxides being reduced to metallic state.

Hydrogen is most easily obtained by the decomposition of water. This decomposition may be effected in many different ways; for instance, by passing steam through a pipe containing clean iron turnings, and heated to a bright red heat, the water or steam is decomposed, the oxygen uniting with the iron turnings and forming oxide of iron, while the hydrogen passes off at the orifice of the pipe, and may be collected there. This may appear strange but many cases of a like description fall under the observation of the chemist, indeed it appears, that, under certain circumstances, chemical action will assuredly take place, whether causing the decomposition of a compound or the union of simple elements; so, if steam be passed through a pipe as above described, hydrogen may be collected, and oxide of iron will be formed; but, if the hydrogen be then passed back again over the oxide of iron, the heat being still kept up, steam will issue from the orifice, and, if condensed, will be found to be the exact amount of water previously decomposed; the oxide of iron, also, will be found again reduced to the metallic state, not indeed as at first, with bright surfaces, but covered with a black powder, from its very fine state of division. There are many other modes of decomposing water, for the purpose of obtaining hydrogen; cuttings of zinc, and sulphuric acid, put in water, decompose the water, the zinc becoming sulphate of zinc, and hydrogen passing off as a gas. This is attributable to the fact that zinc has a greater affinity or tendency to unite with oxygen than hydrogen has at ordinary temperatures.

Hydrogen gas when allowed to come in contact with the oxides or salts of some of the metals, reduces the salt or oxide to the metallic state. This is a fact requiring the particular attention of artists; as nearly all the colours used in painting are metallic oxides—and will, therefore, if exposed to free hydrogen gas (even though in small quantity—such as in a smoky room) become reduced to the metallic state on the surface. This effect will assuredly take place if the colors are preparations of lead, silver or mercury,—such as white lead chromate of lead (chrome yellow), chromate of silver, or sulphurate of mercury (vermillion); the whole of these colors will become more or less blackened in a short time, if not properly protected by good varnishes, &c.

Iron Moulding.

Figs. 1. 2. 3. 4.



The effect of heat upon the most fractious and hard of all the products of nature and art, are truly wonderful. The stubborn iron which can by a blow sever the flinty rock, can by the action of simple heat (but how complex too,) be made to flow like water from the fountain. Taking advantage of this law, and of its solidifying when cold, the founder pours his liquid metal into moulds and allowing it to cool therein, it comes out in every variety of form, according to the patterns used. The first patterns are made of wood. Pattern making forms a branch of business by itself and the operatives generally are men of ingenuity and intelligence. White pine is the wood that is commonly used for the pattern. It is cheap and easily worked. Mahogany is used for making patterns of fine work, such as bushes for journals, pinions and small wheels. It cuts very clean, and has a fine close grain. Maple, although not used in the trade, is very suitable for sharp, well defined patterns intended for constant use. For stove patterns, some parts, such as a border, are sometimes made of a soft metal of lead and tin, transferred from a plaster of Paris mould. After an original wood pattern is made, for light flat moulding, an iron pattern is cast by it, and this is used afterwards for all the moulds. To preserve wood patterns, some cover them with a coat of paint to keep them from being injured by the damp sand, but a varnish made of shellac dissolved in alcohol is much better.

Patterns must be made in such a way, and in such parts as to render the moulding of them practicable, such as the making of the cores, for holes or openings in the castings. For example, were it required to cast a coupling for shafts of a cylindrical form 12 inches deep by 8 inches diameter outside and 4 inside, like fig. 1, a pattern of the same size, fig. 2, is made and two core prints A B, are put on in the proper position to support the core, which is made of sand in a box made of two pieces, fig. 3, held together by pins. Into each piece of the box, half the core hole is cut, to take out the core easily, when it is formed in it.—

Fig. 5.

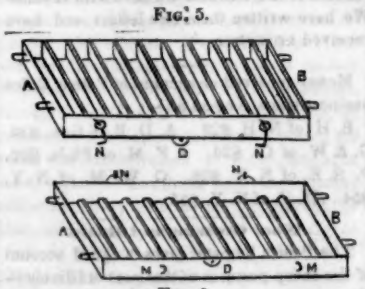
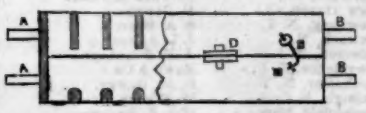


Fig. 6.

After pattern fig. 2 has been made, the core formed in the box fig. 3, is inserted in the recesses left for it by the core prints, the casting fig. 1 will be made, which otherwise would be solid. Were a pattern made like fig. 1, with the hole for the core made through it, when the pattern was withdrawn from the sand, it would draw the core away with it, especially would this happen if the core was placed horizontally. Thus by distinct cores formed in boxes, openings are made in the castings, still it is not impossible to form the patterns to make the cores. Square cores are formed by two pieces of wood A B, fig. 4.—They are made of the required thickness and kept apart by two pieces C D, forming the core required, by filling the space within with sand.

Green Sand Moulding, is different from dry sand moulding, because damp sand is used. In green sand moulding boxes are always employed to contain the sand in which the pattern is moulded. These boxes are made of different sizes, and where a number of castings of one form is required, it is best to have boxes expressly for them, that the moulder may not expend labor in raming useless corners. Generally these boxes are made rectangular in two parts, as shown in figs. 5 and 6. This box has no top or bottom. Each box is made of an outside rectangular frame A B, which is about 4 or 5 inches deep, for light flat moulding. They have ribs placed at equal distances apart. The box is open to allow the sand to be rammed down in a close mass. These boxes are roughly made and the rougher the better. As there is no covering, it is named "open sand casting," and is for articles of a rough nature. Fig. 7, is a longitudinal view (part section,) of a pair of boxes

Fig. 7.



which shows that the ribs of the upper box are not so deep as the outside frame. They are generally an inch less in depth, to allow a depth of sand over the pattern that is embedded in the sand of the lower box. The lower box is called the drag box, and its ribs are shorter and thicker than the upper, it allows more available space for the pattern and does not need to be moved and inverted like the upper one. There are two handles at each end to allow the box to be moved by two men.—They have also hooks and eyes N M, generally three, to couple them together, as represented by fig. 7. The drag box has also pins D, cast on ears at the side, which pass through holes in ears made on the upper box, so that the boxes when placed together will always be retained in the same relative position to one another, and they are held tightly to one another by the hooks and eyes.

(*To be continued.*)

Next week, we shall treat of the kinds of sand used and also the tools.

Malt-Dust or "Sprouts."

Barley, in undergoing the process of malting, sprouts, and after the grain or malt is dried, the rootlets are rubbed off. One hundred bushels of barley are said to yield four or five bushels of this dust. It is a very powerful manure, and is used in England as top-dressing to different crops. It is sometimes used in forming composts, owing to the large proportion of nitrogen it contains, its tendency to fermentation is great; and on this account it is valuable to mix with peat or coarse vegetable matters. A small quantity of the dust, say four bushels to a common-cart load of peat, laid up in layers with the peat, will soon reduce it to a good manure. A handful of this dust to a hill of Indian corn, is a strong stimulant to growth.

Precautions against Poison.

In Germany, to prevent poison being obtained for evil purposes, none is allowed to be sold without a written order or certificate from a physician. To prevent rat poison being made a bad use of, or taken by mistake, the arsenic is mixed with tallow and lampblack, which makes a compound that no human beings could partake of. None is allowed to be sold in a pure state.

[We would like to see the above practice adopted here.

A Fact to be Remembered.

The recent sudden increase of cholera in Paris, says a French paper, "took place on a Sunday, on a day of general amusement," when there was an enormous consumption of the various preparations of ice, and when other excesses were indulged in. A striking and solemn testimony is thus borne, in a quarter where least expected, as to the evil of turning the holy Sabbath into a season of amusement.

LITERARY NOTICES.

Pictorial National Library, published in monthly numbers by Wm. Simonds 12 School street, Boston. Terms $2 per annum.

The August number of the above Magazine has been received. It contains thirteen original engravings and 53 pages of instructive reading. This publication deservedly sustains a high reputation wherever it is known.

American Phrenological Journal.

This Journal for August contains a likeness and biography of Father Mathew, also a phrenological description of Mr. Fordice Hitchcock, besides a great deal of very interesting and useful matter.

Water Cure Journal.

This Herald of Reforms contains an unusual amount of excellent information, excellent because practical, and practical because truthful and plain.

Banker's Magazine.

This Magazine for August, is a most valuable number Bank robberies, important law cases, circulation of coin in England, capital, its origin, growth and application, are some of the many able and valuable articles in it. It possesses information for every man who can read.